X-Ray Film Processor Water Saving Rebate Program
Proposal – Part One

Part A – Project Information

1. Applying for: Prop 13 Urban Water Conservation Grant
2. Principal applicant: Inland Empire Utilities Agency
3. Project Title: X-Ray Film Processor Retrofit Program
4. Person Authorized to Sign: Richard W. Atwater, CEO/General Manager
   9400 Cherry Avenue
   Fontana, CA
   909-357-0241
   atwater@ieua.com

5. Contact Person: David Hill, Manager of Water Resources
   Same
   dhill@ieua.org

6. Funds Requested: $230,000
7. Applicant Funds: $ 15,750
8. Total Project Costs: $245,750
9. Estimated Total Quantifiable project benefits (dollar amount) $540,474 (over ten years)
10. Estimated annual amount of water to be saved: 125.4 acre-feet per year (AFY)
11. Estimated total amount of water to be saved: 1,254 (AF) over ten years
12. Duration of Project (month/year to month/year): October 2002 to June 2003
13. State Assembly Districts where the project is to be conducted: 61st and 63rd Districts
14. State Senate Districts where the project is to be conducted: 31st, 29th, and 32nd Districts
15. Congressional Districts where the project is to be conducted: 41st and 42nd Districts
16. County where the project is to be conducted: San Bernardino County
17. Date most recent UWMP submitted to the DWR: December 2000
18. Type of Applicant: (e)
19. Project Focus: Urban
20. Project Type: (a)
21. Do the actions in this proposal involve physical changes in land use, or potential future changes in land use? No

X-Ray Film Processor Water Saving Rebate Program

Proposal - Part One

Part B - Signature Page

By signing below, the official declares the following:

The truthfulness of all representations in the proposal;

The individual signing the form is authorized to submit the proposal on behalf of the applicant; and,

The individual signing this form has read and understood the conflict of interest and confidentiality section and waives any and all rights to privacy and confidentiality of the proposal on behalf of the applicant.

_____	Richard W. Atwater, CEO/General Manager	February 28, 2002
Signature	Name and Title	Date

X-Ray Film Processor Water Saving Rebate Program
Proposal – Part Two

Project Summary

The Inland Empire Utilities Agency (IEUA) is a wholesale water district that distributes imported water, provides industrial/municipal wastewater collection and treatment services, recycled water, and other services to the cities of Chino, Chino Hills, Fontana, Montclair, Ontario, and Upland, as well as Cucamonga County Water District. The Agency serves a population of approximately 700,000 in a 242-square mile service area of southwest San Bernardino County.

IEUA is a signatory to the California Urban Water Conservation Council (CUWCC) memorandum of understanding (MOU) regarding urban water best management practices (BMP). IEUA is committed to implementing the fourteen BMP's identified in this conservation agreement. IEUA completed an Urban Water Management Plan (UWMP) in December 2000 that sets a goal of saving 25,000 acre-feet (AF) of water per year by 2020.

The Problem

The water used in medical x-ray film processor machines presents a significant opportunity for conservation. Hospitals and clinics commonly have several medical x-ray processors operating on site 24 hours a day, 365 days a year. Published water flow rates for this equipment range from .2 to 2.5 gallons per minute (gpm) or 105,120 to 1,314,000 gallons per year (gpy). Units operating at 2.5 gpm are very common while those operating at .2 gpm are rare. The water comes from the tap, is used once, and then allowed to flow down a drain to the sewer system.

New technology has been developed that, when installed on the x-ray film processor machines, enables this equipment to reduce overall water consumption to approximately 35,000 gpy -- a dramatic 96% reduction in water use. The new water saving device is called a "Water Saver/Plus" and is manufactured by C & A X-Ray, a private corporation based in Paramount, California. The Metropolitan Water District of Southern California (MWD) has tested the Water Saver/Plus equipment, and verified the water savings through their September 2001 study (see Attachment 1). This test took place at hospitals within the service areas of Irvine Ranch Water District, Upper San Gabriel Municipal Water District and East Bay Municipal Utilities District. Attachment #2 is a newspaper story from the San Gabriel Valley Tribune about C & A X-Ray and the efficacy of the Water Saver/Plus. In the 3 test sites where the Water Saver/Plus was installed, the total projected water savings is 8,535,109 gallons or 26.19 AF for 8 Water Saver/Plus units installed. This test demonstrates a water use reduction of 98.7 percent.

The Solution

IEUA proposes to offer a regional rebate program within its 242-square mile service area for the retrofit of up to 50 x-ray film processor units with the Water Saver/Plus device. Preliminary research shows that there are seven major hospitals within the IEUA service area, and they use 45 x-ray processor machines that operate 24 hours a day, 365

days a year. Further, there are hundreds of health clinics that also use x-ray processors within IEUA's service area. To date, none of these health care facilities have installed the Water Saver/Plus technology. IEUA' goal is to retrofit 50 x-ray processor units with the Water Saver/Plus device by June 2003. As a result of this rebate program, the Agency expects to conserve nearly 41,000,000 gallons of water per year or 125.4 AF annually. The proposed program is locally cost effective and has a Benefit-Cost ratio of 1.45. The program also fulfills the requirements of BMP 9 for Commercial, Industrial, and Institutional Conservation programs.

PART A. Scope of Work: Relevance and Importance

1. Nature, Scope, and Objectives of the Project

The purpose of the proposed X-Ray Film Processor Water Saving Rebate Program is to reduce water used by x-ray film processors within IEUA's service area. With the availability of new water saving technology, this is an easily preventable waste of a large amount of potable water. The retrofit of the X-ray film processors should be implemented as soon as possible to attain these savings. The proposed rebate program is not a demonstration project. It will provide hard water savings at a cost effective price.

The goal of the proposed rebate program is to retrofit up to 50 existing x-ray film processor units within IEUA's service area with the Water Saver/Plus device. The objective is to save 125.4 AF per year and is expected to save 1,254 AF over the 10-year life of the project. If this grant request is funded, IEUA will offer a rebate to hospitals and medical centers within its service area to cover the cost of qualifying equipment. C & A X-Ray will provide marketing and installation services. The cost of installation and maintenance of the Water Saver/Plus device will be borne by the hospitals and medical facilities that receive the rebate. Water savings will be verified for each device. C & A X-Ray will install a small flow meter on the water inlet line at least two weeks prior to installation. The meter will remain in place for at least two weeks following the retrofit of the x-ray film processor to provide data on the amount of water saved by the Water Saver/Plus device. This data will be included in the final report to DWR in June 2003.

Through this rebate program, the Agency expects to conserve nearly 41,000,000 gallons of water per year or 125.4 AF annually. The proposed program is locally cost effective and has a Benefit-Cost ratio of 1.45. The program also fulfills the requirements of BMP 9 for Commercial, Industrial, and Institutional Conservation programs.

2. Statement of Critical Issues

IEUA's service area in the Chino Basin is one of the fastest growing watersheds within California. The current population of almost 700,000 people is expected to double within the next twenty years. As a result of this growth, the need for reliable potable water supplies will also dramatically increase.

Water usage within the Chino Basin is about 300,000 AF of water per year, of which 50,000 AF comes from the State Water Project (because of water quality constraints within the groundwater basin, the region cannot accept Colorado River water). Without

local conservation, recycling and groundwater conjunctive use programs, the region's need for additional imported water from the State Water Project is expected to climb to 100,000 AF – 125,000 AF per year and will place additional pressure on the San Francisco Bay Delta system.

IEUA is committed to implementing local projects that will reduce the region's dependence on imported State Water Project supplies. IEUA's service area is located within the "Solution Area" identified in CALFED's Record of Decision (ROD). The Agency is committed to helping CALFED achieve the commitments of the ROD.

In December 2000, the Agency completed an Urban Water Management Plan that sets the goal of eliminating the need for imported water supplies for up to three years during droughts. Conservation is a critical element in this regional strategy. The Agency's objective is to achieve 25,000 acre-feet of water savings annually within the next twenty years. The water conservation program is consistent with the Chino Basin Peace Agreement and the Optimum Basin Management Plan. In addition, the program meets IEUA's commitment to the California Urban Water Conservation Council Memorandum of Understanding.

The proposed X-Ray Film Processor Rebate Program is expected to produce up to 125 AF of water savings per year and 1,250 AF over the ten-year life of the equipment. This represents 12.5 percent of the region's Urban Water Management Plan annual conservation goal. These savings will directly benefit CALFED and the San Francisco Bay Delta because they offset water that would otherwise need to be imported from northern California.

PART B. Scope of Work: Technical/Scientific Merit, Feasibility, Monitoring and Assessment

1. Methods, Procedures and Facilities

X-Ray film processors use water to rinse processing chemicals from the film before it enters the dryer section of the machine. There are four stages of X-Ray film development:

A) Film goes through the "developer" chemicals. Processors contain a coil that heats the developer to 95 degrees. The developer is the only liquid in the processor that needs to be heated. After the developer, the film rolls through squeegee-type rollers to remove most of the developer chemicals.

B) Film goes through the fixer chemicals that stop the developing process. This is not temperature sensitive. From here, the film goes through another set of squeegee-type rollers to remove most of the fixer chemicals.

C) Film goes through a rinse cycle to remove any remaining excess chemicals. This is the point in the process in which the processor receives a constant supply of running tap water, up to 2.5 gpm.

D) Finally, the film goes through another set of squeegee rollers to remove the rinse water and enters the dryer. The heating coils in the dryer section run at about 120 degrees. Cool tap water is needed to prevent the machine from overheating. This water is circulated around the machine and then discharged to the drain. Maintenance on the processors is ordinarily done every 1 to 2 weeks, depending on the type of processor and its use.

New technology has been developed that, when installed on the x-ray film processor machines, enables this equipment to reduce overall water consumption to approximately 35,000 gpy -- a dramatic 96% reduction in water use. The new water saving device is called a "Water Saver/Plus" and is manufactured by C & X-Ray, a private corporation based in Paramount, California.

To conserve the water used for cooling, the Water Saver/Plus device is attached to an existing x-ray film processor. It captures and re-circulates water that would otherwise be released to the drain. The device holds 15 gallons of water and pumps water from the bottom of the tank into the processor. A timer releases a set amount of cool, fresh water, up to four gallons per hour, into the processor unit to maintain proper temperature control. The cool water enters at the bottom of the tank, near where water is pumped to the processor, and an equal amount of "old" water flows to the drain at the top, near where the "old" water is returned to the tank from the processor.

The device stands 26" high within a 15" x 15" footprint. No operational changes are necessary to use this technology, although the processor does need to be shut down during installation (about one hour). No additional chemicals are needed to operate the equipment, and there is no impact on the environment.

The equipment requires cleaning every 2 weeks to prevent chemical build-up. This is consistent with the standard maintenance schedule for the x-ray units. The unit is drained, rinsed, scrubbed, rinsed again, and an algaecide is added. Cleaning cost is approximately $50 per unit per month or $1,300 annually.

The Metropolitan Water District (MWD) of Southern California has tested the Water Saver/Plus equipment, and verified the water savings through their September 2001 study (see Attachment 1). This test took place at hospitals within the service areas of Irvine Ranch Water District, Upper San Gabriel Municipal Water District and East Bay Municipal Utilities District. Attachment #2 is a newspaper story from the San Gabriel Valley Tribune about C & A X-Ray and the efficacy of the Water Saver/Plus.

2. Feasibility

New technology has been developed that, when installed on the x-ray film processor machines, enables this equipment to reduce overall water consumption to approximately 35,000 gpy -- a dramatic 96% reduction in water use. The water saving device is called a "Water Saver/Plus" and is manufactured by C & X-Ray. The MWD has tested the Water Saver/Plus equipment and verified the water savings through a September 2001 study

(see Attachment 1). This test took place at hospitals within the service areas of Irvine Ranch Water District, Upper San Gabriel Municipal Water District and East Bay Municipal Utilities District. The test concludes that the amount of water being used by x-ray film processors can be reduced without adversely affecting the film quality. Ultimately, the number of x-ray film processors in the Southern California region represents enormous potential water savings.

3. IEUA Rebate Program

IEUA proposes to offer a rebate that covers the full cost of the Water Saver/Plus equipment. Participating hospitals and medical centers will submit an application to IEUA for the rebate. Upon verification that the equipment has been purchased and installed, IEUA will provide a check to the rebate recipient for $4,600 for each unit installed. IEUA will submit all appropriate paperwork to DWR for reimbursement.

4. Task List and Schedule

Below is a task list and schedule with estimated costs associated with each task. Please note that installation costs include metering of water use two weeks before the installation of the Water Saver/Plus device and for two weeks after it is in use. The metering data will be used to verify water savings.

Date	Task	Budget Item	Amount
Oct '02	IEUA and DWR Contract Execution	IEUA	$0
Oct-Dec'02	Hospital Contact	C&A X-Ray	$0
Dec '02	C & A X-Ray and Hospital Contract Execution	C&A X-Ray	$0
Dec '02	Water Saver/Plus Installations Begin	C&A X-Ray	N/A
April '03	Installations Completed	C&A X-Ray	N/A
April '03	50 Water Saver/Plus Units Purchased	DWR/Prop 13	$230,000
April '03	Labor for installation of 50 Units @$200/unit	Hospital Facilities	$10,000
Oct 02-June '03	Project Administration	IEUA	$5,750
June '03	Final Report and Accounting to DWR	IEUA	$0
	Total Estimated Costs		**$245,750**

5. Monitoring and Assessment

A water meter (probably a Neptune T-10, brass, 5/8") will be affixed to the existing intake line for a period of two weeks before and after installation of the Water Saver/Plus device to determine water savings. C & A X-Ray will be given the opportunity to remove the meter. IEUA will provide a final report to the California Department of Water Resources on the installation process, satisfaction level of medical staff with the Water Saver/Plus, and monitoring results at the end of the project in June 2003. As a follow-up to the installation, IEUA will conduct a phone survey of the rebate recipients to verify that the unit(s) is still installed and working properly. This information will be added to the final report to DWR in June '03. Please note that C & A X-Ray will be responsible for guaranteeing the performance of equipment on a contractual basis with the health care facility. Finally, IEUA will compile the data for use in the California Urban Water Conservation Council bi-annual reports and IEUA's Urban Water Management Plan update.

6. Preliminary Plans and Specifications (Not required for this grant application)

Part C. Qualifications of the Applicants and Cooperators

1. Project Managers

Inland Empire Utilities Agency – Kathy Tiegs, Conservation Coordinator
(Resume is attached)

Inland Empire Utilities Agency – David Hill, Manager of Water Resources
(Resume is attached)

2. External Cooperators

C & A X-Ray

Mike Ferrara is the General Manager for C & A X-Ray, which is the sole vendor of the patented technology. C & A X-Ray will be responsible for installing the equipment.

Part D. Benefits and Costs

1. Budget Breakdown and Justification

Items	**Costs**	**Justification**
Land Purchase/Easement	$0	
Planning/Design/Engineering	$0	
Materials/Installation	$10,000	Labor to install 50 Water Saver/Plus Devices
Structures	$0	
Equipment Purchases/Rentals	$230,000	Purchase of 50 Water Saver/Plus Devices @ $4,600 each
Environmental Mitigation/Enhancement	$0	
Construction/Administration	$5.750	Staff time for IEUA project administration
Project/Legal/License Fees	$0	
Contingency	$0	
Total	$245,750	

2. Cost Sharing

If this grant is approved, funding will be used for the rebate of the purchase of the 50 Water Saver/Plus units at a cost of $4,600 per unit. The hospital or clinic receiving the rebate will be responsible for the cost of installing and maintaining the Water Saver/Plus device. IEUA will fund the staff time associated with project administration and reporting requirements. Thus, the grant funds will be used only for equipment that generates water savings.

3. Benefit Summary and Breakdown

Estimated Water Use Per X-Ray Film Processor	**Results**
Flow Rate for Most Common X-Ray Film Processor without Water Saver/Plus	2.5 GPM
Flow rate for most common x-ray film processors without Water Saver/Plus	850,000 GPY*
Flow rate for most common x-ray film processors with Water Saver/Plus	35,000 GPY
Estimated Savings	815,000 GPY
Percent Reduction	96%
Convert to Cubic Feet	1,023 HCF Saved Annually
Convert to Acre Feet	2.5 AFY

*Total water usage is reduced for shut down occurring during periodic maintenance.

Estimated Water Savings For Total Project	**Results**
Single X-Ray Processor Unit	815,000 GPY
In Acre Feet	2.5 AFY
Multiplied by 50 Processor Units	125.4 AFY
Estimated Life of the Water Saver/Plus	10 Years
Total Water Savings in AF for life of product	1,254 AF
Project Cost	$245,750
Cost per AF @ $245,750	$196 per AF
Cost per AF Local Share @ $15,750	$12 per AF
Cost per AF DWR/Prop 13 Funding @ $230,000	$183 per AF

Estimating the Value Per Unit to the End User	**HCF**	**Annual Savings**
Value to Customer @ $1.25 per CCF (Retail Water Rate)	1,089	$1,361
Value to customer @ $1.75 per HCF (Retail + Sewer Rate)	1,089	$1,905

Estimating the Value Per Unit Installed to IEUA	**Results**
Marginal Cost of Water (Imported), per AF	$431
Value to IEUA (Annual Savings)	$54,047
Value to IEUA (Life of Project)	$540,474
Present Value of Saved Water	$397,407 (Discounted 6% for 10 years)
Local Investment	$15,750

Net Present Value Method
NPV = Discounted Benefits – Costs
$397,047 - $245,750 = $151,297

Benefit Cost Ratio Method
BCR = Sum of Discounted Benefits/Sum of Costs
$357,047/$245,750 = 1.45

Simple Pay Back Analysis
Savings per Year = $54,047
IEUA @$431/AF x 125.4 AFY = $54,047/year
$245,750/$54,047 = 4.7 Years

Additional benefits from this program include reduced demand on wastewater treatment facilities (water and energy savings). The program supports the region's implementation of the Chino Basin Optimum Basin Management Program and the 2000 Peace Agreement.

Part E. Outreach, Community Involvement and Acceptance

As a wholesale water agency, IEUA has developed its conservation program in collaboration with the seven member agencies that serve as the water retailers for the service area. The conservation program is strongly supported by these member agencies. The program is also strongly supported by the Chino Basin Watermaster and Chino Basin Water Conservation District. The region is committed to achieving the 25,000 acre-foot conservation goal set by the Urban Water Management Plan.

The proposed X-Ray Film Processor Water Saving Rebate Program has been developed with the full involvement of IEUA's member agencies. They have agreed to help promote the program and to provide staff support as necessary. Outreach efforts will include a press conference announcing the availability of the rebate, advertising through member agency newsletters and publications, local cable television spots and publicity through local papers. Program advertising will feature two messages: the value of conserving water within the Chino Basin and the importance of contributing to the protection of the San Francisco Bay Delta by reducing regional demand for imported State Water Project water.

Conclusion
Medical x-ray processors represent a significant conservation opportunity. To date, not one x-ray processor within the IEUA service area has been retrofitted with a relatively simple technology that reduces water use by approximately 96 percent without affecting the quality of the product. By providing the funding necessary to cover the capital costs of the purchase of this equipment, the State of California (through the Department of Water Resources) is significantly adding to the water solution for California.